

OUR ASTRONOMICAL COLUMN.

COMET MOREHOUSE, 1908c.—Numerous results of observations, appearing in several journals, indicate that in comet 1908c we have one of the most interesting cometary visitors that has been discovered of late years.

In the *Comptes rendus* for October 26 (p. 730, No. 17) M. Borrelly describes the observations made at the Marseilles Observatory between September 12 and October 3, and states that his photographs bear evidence of striking changes in the form and extent of the tail system. On September 20 two branches of the tail were shown, one rectilinear, the other curved, and the general appearance resembled that of Donati's 1858 comet; on September 28 the double tail was 5° in length, but on October 2, although triple, it was much shorter. Five tails were shown on the plate of October 3, and the trail of an occulted star indicates a slight absorption effect.

According to M. L. Rabourdin, observing at Meudon, great changes took place from one day to the next, and obvious changes were observed even during the course of an hour; on several plates the tail has an undulating appearance.

Changes, similar to those recorded above, are described by M. Gautier in No. 4278 of the *Astronomische Nachrichten* (p. 97, October 29). The observations were made at the Geneva Observatory during the period October 14–18.

According to a letter to Mr. H. C. Plummer, which appears in the *Observatory* (No. 402, p. 423, November), Prof. Barnard followed the comet closely from September 2 to October 13, and got one or more photographs on each of thirty nights during that period. He states that the photographs of September 30 are unique, whilst the transformation, which took place between the taking of them and the taking of his next one on October 1, was very wonderful. Fortunately there is a Greenwich photograph taken during the interval.

We give below a further extract from Prof. Kobold's ephemeris:—

Ephemeris 12h. M.T. Berlin.

1908	a (true) h. m.	δ (true) ° ' "	1908	a (true) h. m.	δ (true) ° ' "
Nov. 12 ...	18 52'5 ...	+8 46'3	Nov. 22 ...	18 50'8 ...	-0 21'2
14 ...	18 52'0 ...	+6 45'0	24 ...	18 50'7 ...	-1 55'0
16 ...	18 51'6 ...	+4 50'0	26 ...	18 50'5 ...	-3 24'7
18 ...	18 51'3 ...	+3 0'8	28 ...	18 50'4 ...	-4 50'3
20 ...	18 51'0 ...	+1 17'3	30 ...	18 50'4 ...	-6 12'6

DONATI'S COMET AND THE COMET OF 69 B.C.—Following up the suggestion that Donati's comet (1858 VI.), of which the period is probably something like 2000 years, was identical with the great comet recorded in the Chinese annals as having appeared in 69 B.C., Herr Kritzingen has compared the available data, and finds that the elements differ so much, especially in the inclination of the orbit plane, that the identity cannot be maintained. In fact, the Chinese comet cannot be identified with any later bright comet. Of all the earlier comets, it appears that the one recorded in China in 146 B.C. is the most likely to correspond with Donati's, but the identity is, at the best, very uncertain (*Astronomische Nachrichten*, No. 4277, p. 65, October 20).

TERRESTRIAL ELECTRICITY AND SOLAR ACTIVITY.—In No. 15 of the *Comptes rendus* Dr. A. Nodon reports that on October 2 his instruments at the Bordeaux Observatory indicated a violent change in the terrestrial electrical charge, and states that this change coincided with the passage of an area of solar activity. He further directs attention to the fact that the changes preceded a violent cyclone, which devastated Guadeloupe, and a magnetic storm, which was registered strongly at the Parc Saint-Maur Observatory.

THE "ASTRONOMISCHEN GESELLSCHAFT" AT VIENNA.—The twenty-second general meeting of the "Astronomischen Gesellschaft" was held at Vienna on September 15–18, and a report of the proceedings, contributed by Prof. Kobold, appears in No. 4277 of the *Astronomische Nachrichten* (p. 71). A proposal to hold the 1910 meeting either in America or at Breslau was discussed, the assembly deciding in favour of the latter.

NO. 2037, VOL. 79]

NEW CATALOGUES OF PROPER MOTIONS.—In No. 4276 of the *Astronomische Nachrichten* (p. 49, October 9) Dr. Ristenpart publishes a second list giving the proper motions, in R.A. and dec., of some 150 stars. The usual designation, the position for 1900, the magnitude, and the precession correction for each object are also given.

The first fascicule of vol. iv. of the "Annales de l'Observatoire astronomique de Tokyo" is also devoted to a catalogue of proper motions. In it Mr. K. Hirayama gives the declinations and proper motions of 246 stars employed in the Tokyo latitude observations, and discusses at length the processes by which they have been determined; the present discussion only includes stars not given in the *Jahrbuch*. In the first table the designation and the particulars of each star as they appear in the various catalogues employed are given, whilst the second table includes the resulting declinations and proper motions.

THE INTERNATIONAL CONGRESS ON TUBERCULOSIS AT WASHINGTON.

EVEN in these days of crowded congresses the International Congress on Tuberculosis, held in the last week of September and the first week of October in Washington, must stand out as a most remarkable meeting, especially in point of numbers, and were it not that the work there attempted was largely "educational" in character, and that the arguments and appeals for better methods of combating tuberculosis were directed to a much wider circle than that gathered in Washington, the promoters might well feel that they had undertaken a task for which the return could not be commensurate with the energy they had to expend. There can be no doubt that the congress was far too large to allow of careful and dispassionate discussion of many of the points that were raised in the different sections, but equally there can be no doubt that the moral and educational effect of such a meeting as that held at Washington must be enormous, not only in the United States and Canada, but in every part of the civilised world.

The keynote of the whole meeting was enthusiasm and earnestness combined with thoroughness. Following the lead offered by the British Association in the meetings in South Africa, the congress was divided into a series of peripatetic bands, which, as they made their way to Philadelphia, Washington, and New York, gave addresses and demonstrations on the special topics on which they were authorities. When the congress was over there were innumerable demands (most of which could not be met owing to the fact that the meetings were held so late, and that most of the delegates hastened home to their respective work as quickly as possible) for lecturers to tarry and give addresses in the various eastern towns of the States and Canada. As soon as a number of the French and English delegates arrived in Quebec, Montreal, and Toronto, they were first feasted, and then asked to address municipal bodies, chambers of commerce, boards of trade, and the like, and Dr. R. W. Philip caught the public ear at once by his terse and lucid statement of the Calmette-Philip dispensary system, which has been attended with such marked success in reducing the death-rate from tuberculosis in Edinburgh. At Montreal the way was thus prepared for a great autumn anti-tuberculosis campaign and exhibition, organised by Prof. Adami and his colleagues. Invitations were received from Chicago, Detroit and elsewhere, but the time before the congress was so limited that many of these had to be refused. Exceedingly convenient was the arrangement to hold a meeting of the International Association for the Prevention of Tuberculosis at Philadelphia a week before the actual discussions were to come on in Washington, and great credit must be given to the president, Dr. Lawrence Flick, to Prof. Pannwitz, the secretary, and to the organising committee in Berlin for the excellent programme there presented to the members.

Of course, much time and energy were devoted to the presentation and discussion of reports on sanatoria, on isolation, disinfection, immunisation against, and treatment of, tuberculosis, and it was interesting to note what

efforts are being made by sanitary authorities all over the civilised world to combat this disease. It was realised, as never before, how widespread and serious are the results of tuberculosis, and at the same time how keenly alive, not only the medical profession, but health authorities generally, have become to the importance of dealing even in drastic fashion with the "white scourge." At the end of each day a popular lecture on some aspect of the question was given, these lectures being entrusted to Dr. Pannwitz, on tuberculosis in its social aspects; Dr. Theodore Williams, on the history of the treatment of tuberculosis; and Dr. Calmette, on the tuberculin ophthalmic reaction, with which his name is now so intimately associated. This preliminary conference had a special interest from the fact that it was authoritatively stated that Koch had been somewhat misunderstood at the London congress, and that his position as regards the non-transmissibility of bovine tuberculosis to the human subject was not so directly opposed to what may be called the popular view as had been held to be the case. Needless to say, such an expression of opinion was received with almost a sigh of relief by those who are convinced of the possibility of such communicability. So strongly was the congress impressed with the necessity of ensuring a milk supply free from any possible contamination by tubercle bacilli that on the last day Prof. Heymans, of Ghent, moved, and it was passed with acclamation, that a committee to inquire into the conditions under which milk may become so contaminated be appointed, and that it report at the conference to be held in Brussels in 1910. This committee is thoroughly international, and representative of both the medical and veterinary professions.

During the Philadelphia week large numbers of those specially interested travelled to Washington to inspect the excellent museum that had been brought together by an energetic organising committee under Dr. H. J. Beyer. No such complete, interesting, and instructive exhibition had ever been brought together before, partly because no such material had hitherto been available. It is open to question whether medals and prizes constitute a desirable means of stimulating exhibitors, but in this instance, although we hope that this distribution of prizes will not form a regular feature of these exhibitions, our American cousins may claim that the success that has attended their efforts justifies the means employed. In the matter of prizes, especially money prizes, Great Britain comes out well; Brompton Hospital, represented by Dr. Theodore Williams, Dr. Lathom, and Dr. M. S. Patterson, takes a prize of one thousand dollars offered for the best exhibit of a hospital for the treatment of advanced cases of pulmonary tuberculosis, whilst the one thousand dollar prize offered for the best exhibit of an existing sanatorium for the treatment of tuberculosis amongst the working classes was divided between the Brompton Hospital Sanatorium at Frimley and the Whitehaven Sanatorium at Whitehaven, Pa.

Another prize, part of which came to our side of the Atlantic, was that offered for the best evidence of effective work in the prevention of tuberculosis since the last congress held in Paris three years ago, the Women's National Health Association of Ireland and the committee on tuberculosis of the New York Sanitary Organisation Society dividing both the honours and the money. Other prizes were the first gold medal, awarded to Great Britain, for the best pathological exhibit, and a silver medal to Dr. Sims Woodhead and Mr. William Henman for plans, with elaborate details and descriptions, of a sanatorium. These are given as examples of the range of subjects for which prizes were awarded; but others were an exhibit of the best laws and ordinances in force on June 1, 1908, for the prevention of phthisis, for which the State of Wisconsin was awarded a gold medal, New York City taking a similar award for the best set of laws and ordinances for the prevention of phthisis shown by any municipality in the world, whilst the awards gained by the National Swedish Anti-Tuberculosis Association further illustrate the eclectic character of the exhibits. This association gained two gold medals, one for having the largest number of any organisation in the world which is

fighting phthisis, and a second for exhibiting the best plans for raising money with which to wage the crusade against tuberculosis. Again, Dr. D. Sarason, of Berlin, received a gold medal for models and plans showing new and interesting principles in house construction in its relation to the prevention of tuberculosis. These are simply examples of a large number, but they serve to indicate the lines on which the organising committee got together a good museum by making a definite demand, a demand which in most cases was promptly met from many quarters. Certain of the visitors before seeing the exhibitions scarcely seemed to realise that many of the schemes and plans described in connection with the various American municipalities were anything more than paper plans, but the working plans, models, and statistics soon made it clear that a large amount of very valuable work has been done and effective measures taken to stem the tide of tuberculosis.

Although a great deal of educational work was done in the pathological, clinical, social, surgical, municipal, veterinary, and other sections, there can be little doubt that the centre of interest was the discussion in the combined sections of bacteriology and tuberculosis of animals, at which Prof. Koch maintained that the practical aspect of the question was so important that he felt justified in confining his attention to it. He was satisfied that the tubercle bacilli in bovine tuberculosis were different from those in human tuberculosis, and that although human beings may be infected by the bovine tubercle bacilli, serious disease rarely occurs as a result of such infection. The human bacilli, on the other hand, play a far more important rôle in the spread of tuberculosis. He did not claim that the results announced at London were final. He and Dr. Schultz then asked that their experiments should be repeated. Many experiments had been carried on, but he should still like to ask how far sources of error had been eliminated. Animals must be free from spontaneous tuberculosis, the early stages of which cannot be recognised.

Tuberculin, of course, had to be used in connection with this work. Further, it was evident that experiments on too small a series of animals could carry but little weight. Then all animals must be protected from any external infection, especially that of bovine origin, and it was, of course, essential that different series of experiments should be kept absolutely separate. All the infections should be made by subcutaneous injection with early cultures that had not passed through more than a single guinea-pig. He believed that doses of ten milligrams were most satisfactory, and he was satisfied that it was a mistake to use too large doses or to introduce the virus by intravenous or intraperitoneal injection. Of course, there should be no contamination of the cultures. He and his colleague had found that all bacilli from bovine source, when injected into cattle, gave rise to progressive, and ultimately generalised, lesions, but that tubercle bacilli of human origin gave rise to localised and regressive lesions only. He wished to point out, too, that as experiments must necessarily extend over long periods, it was essential during this time to eliminate the possibility of secondary infection. Finally, they had to remember that mixed infection by the human and bovine bacilli might occur.

In regard to the experiments of the British commission, he pointed out that immense quantities of phthisical sputum had been given to calves and pigs, and that it was possible that this sputum had contained milk or butter in which were bovine tubercle bacilli.

The first case to which he referred was placed amongst the positive results. To be of value, he considered that the sputum should have been taken from one case only, and that all possibility of infection by either milk or butter should have been eliminated. He thought the British Royal Commission failed in several respects, and that many of his opponents had not been sufficiently careful on certain of these matters. He maintained that he had never held that we were dealing with two distinct species, but that we had to deal with two different types.

Bearing this in mind, he considered that laboratory experiments, bearing on modification of the characters of

the bacilli, were merely of academic importance, and that any question arising out of them was merely of theoretical value. We had to deal with the properties of "fresh" bacilli, and with these only. He believed that competent investigators were in agreement that the human tubercle bacillus differs from the bovine tubercle bacillus, that this latter does not cause progressive tuberculosis in man, and that, therefore, from the practical point of view, it might be left out of consideration in our crusade against tuberculosis.

Prof. Theobald Smith, though agreeing with certain of Dr. Koch's contentions, was by no means in accord with him as to the sharp line of demarcation that he drew between the human and bovine types of the tubercle bacillus. He believed, moreover, that there was an actual increase of virulence obtained by passage, and that a selective and protective action of the tissues probably comes into play, and he was convinced that increased virulence did not mean change of type.

Prof. Sims Woodhead claimed that in no sense of the word did the members of the British Royal Commission regard themselves as Koch's opponents. He believed they were all working to one end—the elucidation of a problem which Prof. Koch had set before them, a problem he was satisfied they were all anxious to solve, in great measure, too, because of the respect in which they held their great colleague, though even his great authority could not outweigh their own observations and conclusions. In regard to the conditions laid down by Koch, the British Royal Commission had exercised the greatest care to observe each one. Their Government had been induced to spend a very large sum in order to provide sufficient help, and through the patriotic generosity of Lord Blyth a couple of farms, a considerable distance from each other, which could be completely isolated, and a central laboratory between the two, to which material to be worked out could be brought, thus doing away with any necessity for any direct communication between the farms, had been placed at their disposal. As to animals, they were fortunate in having near them an island in which tuberculosis had never yet broken out among the cattle—Jersey—and from which they had been able to obtain a very large supply of bovines on which to carry out their very numerous experiments. They had obtained the assistance of well trained and enthusiastic experts in whom they had every confidence, and the results they had obtained had been set forth in their reports in the greatest detail, so that those who questioned their opinion might see the data on which they were founded, and he asked anyone who read their report to go to the appendix to the report for the details of any case in which they thought there might be any doubt; they might then form their own opinions.

He asked them to accept all this as evidence that they, the commissioners, and their Government were at one with Prof. Koch in looking upon the question as an intensely practical one. They felt that no stone should be left unturned to test the accuracy of statements of such enormous importance, and from the experimental evidence they had been able to obtain they were of opinion that conclusions had been arrived at on quite insufficient data. Prof. Koch had criticised a single one of their experiments. They had taken the utmost care to eliminate the dangers that Prof. Koch had pointed out; but, allowing for a moment that there were flaws in this experiment, one of the earliest that they conducted, he would direct attention to other cases, bearing on the same point, in which he believed they would find no such opening for criticism. It could not be a question of merely "academic" interest when some 30 per cent. of the cases under five years of age reported by the two commissions, the British and the German, were of alimentary origin, for, as calculated by Dr. Cabbett, this meant that about 7 per cent. of the cases of tuberculosis probably resulted from infection from a bovine source, and 7 per cent. of the cases, allowing a little latitude on either side, could not be looked upon as a negligible quantity. Prof. Koch had stated that the alimentary cases were selected, but he should like to point out that at first this was done for a short time because Prof. Koch had been able to find so few cases in Germany. Later they found this unnecessary.

In regard to the question of modification of tubercle bacilli, he was not in a position to say more than had appeared in the report of the commissioners, but he would like to point out that the period after the infection at which the disease manifested itself was so great that many people could not bring themselves to believe that cause and effect were in any way associated, and they scoffed at the idea of tuberculosis being infective. Would not this slow growth place similar difficulties in tracing the modification either of morphological characters or of virulence of the tubercle bacilli? Was it not possible, however, that some of the conditions that regulated the modification of the more rapidly growing bacilli should obtain in the more slowly growing bacilli, allowing, of course, for the much longer period necessary for these modifications to come into effect?

He thought that those who undertook the responsibility of saying that there is no danger to the community, either directly or through an increase of tuberculosis amongst cattle, accepted a very grave responsibility indeed, and for his part he was so impressed by the evidence that had already been obtained, not only in England, America, and Germany, but in France, Denmark, and elsewhere, that he should be loath to countenance the relaxation of a single regulation having for its object the extermination of bovine tuberculosis. Indeed, he would go further, and say that in the interests of the public health still more stringent regulations might have to be put into force.

The outcome of the various discussions may be summed up in the statement that there can be no tuberculosis without the tubercle bacillus, and that although under certain conditions the human subject and the lower animals may resist the invasion of this micro-organism, there are times and conditions in which the vitality and resisting power of the tissues are so greatly impaired that the tubercle bacillus is able to invade the body and cause degenerative lesions in the tissues, and tuberculosis is set up. It was agreed that no hard and fast rule can be laid down for every set of conditions under which the tubercle bacillus is or may be present, but that every means should be taken to kill the bacillus as it comes from any centre of infection before it has had time or opportunity to infect other organisms, and that at the same time all possible means should be taken to raise the insusceptibility or resisting power of any organisms that may be attacked. In open and advanced cases of tuberculosis isolation of the human being and slaughter of cattle are advisable. In the case of cattle an affection of the milk gland should be a sign for the destruction of the animal affected. The sanatorium treatment should be looked upon as being useful from three points of view:—(1) as isolating the patient temporarily; (2) as giving opportunity of instructing the patient as to the best means of disinfecting sputa, &c., which, under ordinary conditions, are a great source of infection; and (3) as commencing the treatment and building up of the patient and educating him as to what, in the interests of his own health, he may do and what he may not. In this connection it may be pointed out that Dr. M. S. Patterson's demonstration of the excellent work that is being done at Frimley was one of the most valuable and instructive lessons given at the congress. He showed that graduated labour seems to help to immunise the patient, to build up his physical powers, to give him confidence, and to improve his morale in so far that, instead of allowing him to degenerate into a valetudinarian, with thoughts only of his own ailments, he receives the inspiration of the knowledge that he can still work and earn his own living and not only this, but that under proper conditions work is a factor in his recovery. At the present time, when we have promises of legislation in the air, one cannot but feel that those who are responsible for legislation concerning tuberculosis cannot do better than study carefully the results that have been obtained abroad by men perhaps with less experience than ourselves, but also less hide-bound by precedent and tradition than are we. The announcement of the intention of the Local Government Board to enforce compulsory notification of phthisis amongst poor-law patients, for which Dr. Newsholme said he had the authority of the President of the Local Government Board, was received with loud applause at the opening meeting of the congress.